

What is Claimed

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1. A lifting assembly arranged to lift an object which has a width dimension and is at least partially surrounded by a base surface which has a substantial horizontal alignment component, such as a manhole cover surrounded by a paved or ground surface, said assembly comprising:
- a. a base support assembly comprising;
    - i. a beam structure which has a lengthwise axis, is adapted to be positioned above the object, and has a length dimension greater than the width dimension of the object, said beam structure having a first pivot end and a second mobile end;
    - ii. a pivot support connected to the beam structure and located at the pivot end thereof, and arranged to support the pivot end of the beam structure from the base surface;
    - iii. a mobile support connected to the beam structure and located at the mobile end thereof, and arranged to support the mobile end of the beam structure from the base surface, said mobile support having mobile base surface engaging means to enable the

mobile support to be moved  
laterally over the base  
surface;

- 5                   b. a lifting mechanism mounted to the  
base support assembly and comprising  
a lift connection to engage said  
object and an actuating means to  
lift said object

whereby said lifting assembly can be positioned  
10 over said object with the pivot support being on  
one side of said object and the mobile support  
being on an opposite side of said object, so that  
said lifting mechanism is able to raise said  
object, and said lifting assembly can be moved  
15 laterally so as to move said object.

~~2. The assembly as recited in claim 1,  
wherein said pivot support is arranged to engage  
said base surface in a manner to remain at a  
substantially stationary base surface location  
20 during movement of said lifting assembly~~

C                   3. The assembly as recited in claim 2,  
wherein the surface engaging <sup>portion</sup> means of the mobile  
support is arranged to move in an arcuate path  
having said stationary location of the pivot  
25 support being at a center of said arcuate path.

C                   4. The assembly as recited in claim 3,  
wherein said surface engaging <sup>portion</sup> means comprises a  
pair of base surface engaging wheels spaced on  
opposite sides of the mobile end of the beam  
30 structure.

5. The assembly as recited in claim 4,  
wherein each of said wheels has an axis of  
rotation, with the two axes of rotation converging

and meeting at substantially said location of the pivot support.

6. The assembly as recited in claim 2,  
wherein said pivot support comprises a post  
5 extending downwardly from the pivot end of the  
beam structure, with a lower end of the post being  
adapted to engage the base surface.

7. The assembly as recited in claim 1,  
wherein said lifting mechanism comprises a lifting  
10 jack mounted to said beam structure at an  
intermediate location between the pivot end and  
the mobile end of the beam structure.

8. The assembly as recited in claim 7,  
wherein said jack has a substantially vertical  
15 lift axis, and said jack has a lifting member  
connecting at a lower end thereof to said lift  
connection, said jack having said actuating means  
to raise said lifting member relative to said beam  
structure.

9. The assembly as recited in claim 8,  
wherein said jack is a screw jack, comprising an  
actuating screw vertically aligned in said jack,  
and further comprising manually operable crank  
20 means to turn said actuating screw.

10. The assembly as recited in claim 1,  
wherein said lift connection comprises a pair of  
collet fingers adapted to be positioned in a lift  
opening of said object, and means to expand said  
collet fingers outwardly to come into gripping  
25 engagement with the surface of said lift opening.

11. The assembly as recited in claim 1,  
wherein there is an auxiliary lift bar which has  
an auxiliary lift connection to lift the object at  
30

an off center connecting location spaced from a center of gravity of said object, said lift bar having a lifting mechanism connecting portion adapted to be located near a center of gravity of said object and be connected to said lifting mechanism near said center of gravity, said auxiliary bar having a torque portion spaced from said center of gravity location, said torque portion having a torque member engaging said object at a location spaced from said off center connecting location to apply a torque from said auxiliary arm to said object so that said object is lifted entirely from said base surface.

12. The assembly as recited in claim 11, wherein said lifting mechanism connecting portion has adjustable connecting means whereby lift connection can be positioned at various distances from said center of gravity.

13. The assembly as recited in claim 1, wherein said object is a manhole cover, and said base surface is a paved or ground surface adjacent to said manhole cover.

14. A method of lifting an object which has a width dimension and is at least partially surrounded by a base surface which has a substantial horizontal alignment component, such as a manhole cover surrounded by a paved or ground surface, said method comprising:

- a. placing a base support assembly over said object so that;
  - i. a beam structure of the support assembly is positioned above the object,

- 5                   said beam structure having a  
                  length dimension greater than  
                  the width dimension of the  
                  object, said beam structure  
                  having a first pivot end and  
                  a second mobile end;
- 10           ii.   locating a pivot support which  
                  is connected to the beam  
                  structure and located at the  
                  pivot end of the beam  
                  structure on one side of the  
                  object to support the pivot  
                  end of the beam structure  
                  from the base surface;
- 15           iii.   locating a mobile support  
                  connected to the beam  
                  structure and located at the  
                  mobile end thereof, and on  
                  opposite sides of the object  
20           to support the mobile end of  
                  the beam structure from the  
                  base surface, said mobile  
                  support having mobile base  
                  surface engaging means to  
25           enable the mobile support to  
                  be moved laterally over the  
                  base surface;
- 30           b.   using a lifting mechanism mounted to  
                  the base support assembly to engage  
                  said object by a lift connection and  
                  utilize an actuating means of said  
                  lifting mechanism to lift said  
                  object;

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c. moving said lifting assembly  
laterally to move said object.

15. The method as recited in claim 14,  
wherein said pivot support engages said base  
5 surface at a substantially stationary base surface  
location during movement of said lifting assembly.

16. The method as recited in claim 15,  
wherein the surface engaging means of the mobile  
support is moved in an arcuate path about said  
10 stationary location of the pivot support as a  
center of said arcuate path.

17. The method as recited in claim 16,  
wherein said surface engaging means comprises a  
pair of base surface engaging wheels spaced on  
15 opposite sides of the mobile end of the beam  
structure, and each of said wheels has an axis of  
rotation, with the two axes of rotation converging  
and meeting at substantially said location of the  
pivot support.

20 18. The method as recited in claim 15,  
wherein said pivot support comprises a post  
extending downwardly from the pivot end of the  
beam structure, with a lower end of the post being  
adapted to engage the base surface.

25 19. The method as recited in claim 14,  
wherein a lifting jack of said lifting mechanism  
is mounted to said beam structure at an  
intermediate location between the pivot end and  
the mobile end of the beam structure and is used  
30 to lift said object.

20. The method as recited in claim 14,  
wherein said object is a manhole cover, and said

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